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EXAMINER

BURD, K

ART UNIT

PAPER NUMBER

2734

DATE MAILED:

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/497,292

Applicant(s)

MARINO, JR.

Examiner

Kevin Burd

Group Art Unit

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☒ Responsive to communication(s) filed on Feb 3, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1035 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1-38 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-38 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☒ The drawing(s) filed on Feb 3, 2000 is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the means to digitize and demodulate the received signals and the converting signals to a corresponding voltage or current must be shown or the features canceled from the claims. No new matter should be entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1-18 and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clough et al (US 4,672,674).

Regarding claims 1-3, 25-27, 34 and 38, Clough et al [Clough] discloses a system for suppressing noise signals from a signal containing both voice data and noise signals, the system comprising:

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a first receiver operative to receive both noise and voice data (column 4 lines 12-14), the first receiver being operative to demodulate and digitize (figure 1 item 5) the voice data and noise signals;

a second receiver operative to receive primarily the noise signals (column 4 lines 14-15), the second receiver being time and frequency synchronized (column 3 lines 10-25) and operative to demodulate and digitize the noise signals (figure 1 item 6);

storage means for storing the samples from the first and second receivers (column 3 lines 36-37); and

adaptive filtering means operative to suppress the noise signals in order to extract the voice data (figure 1 and column 3 lines 31-45 and 53-57).

Although Clough does not disclose receiving radiated emissions and ambient signals, Clough does disclose receiving a desired signal (the information signal) and an interfering signal (noise signal), receiving a interfering signal (noise signal) and subtracting the signals to recover the desired signal. It would have been obvious for one of ordinary skill in the art at the time of the invention to utilize this method of cancellation in any application that required the elimination of interfering signals to allow for the recovery of the desired signal.

Regarding claim 4, Clough discloses a system for suppressing noise signals from a signal containing both voice data and noise signals as stated in paragraph 3. Clough further discloses converting the received signals into a corresponding voltage (figure 1

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items 5 and 6). Clough does not disclose converting the received signals into a corresponding electrical current. However, it would have been obvious for one of ordinary skill in the art at the time of the invention to convert the received signals into a corresponding electrical current. By converting the signals into electrical current, only a minimal loss of signal strength would occur to the signal while traveling along the electrical conducting cable link as compared to a greater loss in voltage form do to the resistance of the wire.

Regarding claims 5 and 6, Clough discloses the noise signals and the voice data /noise signals inputs are received by microphones (column 3 lines 7-8) and the microphones are spaced apart by 3.5 cm (column 3 lines 65-68).

Regarding claims 7-9, Clough further discloses the microphones are coupled to the analog to digital converters (A/D) by and electrical conducting means (figure 1).

Regarding claim 10, Clough discloses the two microphones can be arranged in one boom arm (column 3 lines 62-64).

Regarding claims 11-13, 16, 17 and 35-37, Clough discloses the A/D converters sample the input samples at the same frequency and are therefore synchronized (column 3 lines 14-19). It is inherent that clock signals must be transmitted to each of the A/D converters to maintain this synchronization.

Regarding claim 14, Clough discloses a plurality of microphones can be used to receive the noise signals (column 3 lines 48-52).

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Regarding claim 15, Clough discloses a system for suppressing noise signals from a signal containing both voice data and noise signals as stated in paragraph 3. Clough does not disclose the use of a plurality of microphones to receive the voice data and noise signals. However, it would have been obvious for one of ordinary skill in the art at the time of the invention to use a plurality of microphones to receive the voice data and noise signals. With more than one microphone, it is possible to receive a plurality of voice signals from more than one source and after the noise signal has been removed and with proper filtering, all of the voice signals can be recovered.

Regarding claim 18, Clough discloses a micro-processor is used to conduct the adaptive filtering (column 3 lines 19-22 and figure 1).

4. Claims 19-24 and 28-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clough et al (US 4,672,674) in view of the instant applications admitted prior art.

Regarding claims 19-24 and 28-33, Clough discloses a system for suppressing noise signals from a signal containing both voice data and noise signals as stated in paragraph 3. Clough further discloses adaptive filtering is conducted to recover an audible signal (figure 1 and column 3 lines 39-45 and 53-57). However, Clough does not disclose which adaptive algorithm is used. "The two most common classes of adaptive filter algorithms are Stochastic Gradient based algorithms and Least-square

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based algorithms" page 16 lines 21-23 of the instant application. It would have been obvious for one of ordinary skill in the art to use the most common types of adaptive algorithms in the adaptive filtering conducted by Clough since these types of algorithms are the most widely used.

5. Claim 1-10, 14, 15, 25-27, 34 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US 4,912,767).

Regarding claims 1-3, 25-27, 34 and 38, Chang discloses a system for suppressing noise signals from a signal containing both voice data and noise signals, the system comprising:

- a first receiver operative to receive both noise and voice data (abstract);
- a second receiver operative to receive primarily the noise signals (abstract), the second receiver being time and frequency synchronized (column 3 lines 10-25); and
- adaptive filtering means operative to suppress the noise signals in order to extract the voice data (figure 2 and abstract and column 6 lines 8-15).

Although Chang does not disclose receiving radiated emissions and ambient signals, Chang does disclose receiving a desired signal (the information signal) and an interfering signal (noise signal), receiving a interfering signal (noise signal) and subtracting the signals to recover the desired signal. It would have been obvious for one of ordinary skill in the art at the time of the invention to utilize this method of

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cancellation in any application that required the elimination of interfering signals to allow for the recovery of the desired signal.

Also, Chang does not disclose demodulating and digitizing the received signals in the first and second receivers. It is inherent that this step be done before the signals are to be processed after the subtraction occurs.

Regarding claim 4, Chang further discloses converting the received signals into a corresponding voltage (figure 1 items 5 and 6). Chang does not disclose converting the received signals into a corresponding electrical current. However, it would have been obvious for one of ordinary skill in the art at the time of the invention to convert the received signals into a corresponding electrical current. By converting the signals into electrical current, only a minimal loss of signal strength would occur to the signal while traveling along the electrical conducting cable link as compared to a greater loss in voltage form due to the resistance of the wire.

Regarding claims 5 and 6, Chang discloses the noise signals and the voice data /noise signals inputs are received by microphones (column 5 lines 17-29) and the microphones are spaced apart some small distance apart.

Regarding claims 7-9, Chang further discloses the microphones are coupled to the adaptive filters by and electrical conducting means (figure 2).

Regarding claim 10, Clough discloses the two microphones can be arranged on a pilot's face mask (column 5 lines 17-29).

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Regarding claims 14 and 15, Chang does not disclose the use of a plurality of microphones to receive the voice data and noise signals. However, it would have been obvious for one of ordinary skill in the art at the time of the invention to use a plurality of microphones to receive the voice data and noise signals. With more than one microphone, it is possible to receive a plurality of voice signals from more than one source and after the noise signal has been removed and with proper filtering, all of the voice signals can be recovered.

6. Claims 19-24 and 28-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang (US 4,912,767) in view of the instant applications admitted prior art.

Regarding claims 19-24 and 28-33, Chang discloses a system for suppressing noise signals from a signal containing both voice data and noise signals as stated in paragraph 3. Clough further discloses adaptive filtering is conducted to recover an audible signal (figure 2). However, Chang does not disclose which adaptive algorithm is used. "The two most common classes of adaptive filter algorithms are Stochastic Gradient based algorithms and Least-square based algorithms" page 16 lines 21-23 of the instant application. It would have been obvious for one of ordinary skill in the art to use the most common types of adaptive algorithms in the adaptive filtering conducted by Clough since these types of algorithms are the most widely used.

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Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Zurek et al (US 4,956,867) and Schiff (US 4,636,586) discloses noise cancellation systems.

Conclusion

8. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 308-9051, (for formal communications intended for entry)

Or:

(703) 308-6743, (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Burd, whose telephone number is (703) 308-7034. The Examiner can normally be reached on Monday-Thursday from 8:00 AM - 4:30 PM. The examiner can also be reached on alternate Friday.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-4900.

Kevin M. Burd

Kevin M. Burd
PATENT EXAMINER
May 31, 2000

TEMESGHEN GHEBRETINSAE
PRIMARY EXAMINER